

4 INVESTIGATION OF LEAD POISONING CASES

Repairing automotive radiator
using lead/tin solder

During the period 1995 through 1999, 39 workers had one or more BLL reports at or above 60 µg/dl, meeting OLPPP's criteria for intensive follow-up (Appendix B, Table 9).⁹ We investigated each of these new cases of lead poisoning (representing 30 employers) and made specific recommendations for correcting the working conditions that had resulted in a worker becoming lead poisoned. In addition, we investigated 41 cases of take-home lead poisoning (representing 25 employers). Forty of these cases were children and one was an adult

household member (Appendix B, Table 10). OLPPP referred nine employers to Cal/OSHA for failing to comply with our recommendations. These employers included two radiator repair shops, two firing ranges, two battery manufacturing plants, a battery recycler, a lead oxide plant, and a fishing weight manufacturer.

The segment of industry reporting the greatest percentage of serious worker lead poisoning cases was construction (33%), followed by service industry (28%) and manufacturing (26%). Radiator repair shops (classified as service industry) had the largest number of reported cases (9 cases representing 7 employers). Eight cases were reported among painting companies.

Among take-home cases, the largest number of children affected had household members in the radiator repair industry (13 cases), followed by sporting goods stores (10 take-home cases resulted from employees of a retail gun shop given the task of demolishing an old firing range).

Sample Case Investigations

Six examples of 1995-99 case investigations are described below. Three are from general industry, three are from construction; two also involved take-home exposure to family members.

⁹ We initiated case investigations for 39 of the 43 workers reported with BLLs 60 µg/dl or greater. One worker was unable to be contacted, two were already under investigation, and the fourth worker's result was determined to be a lab error.

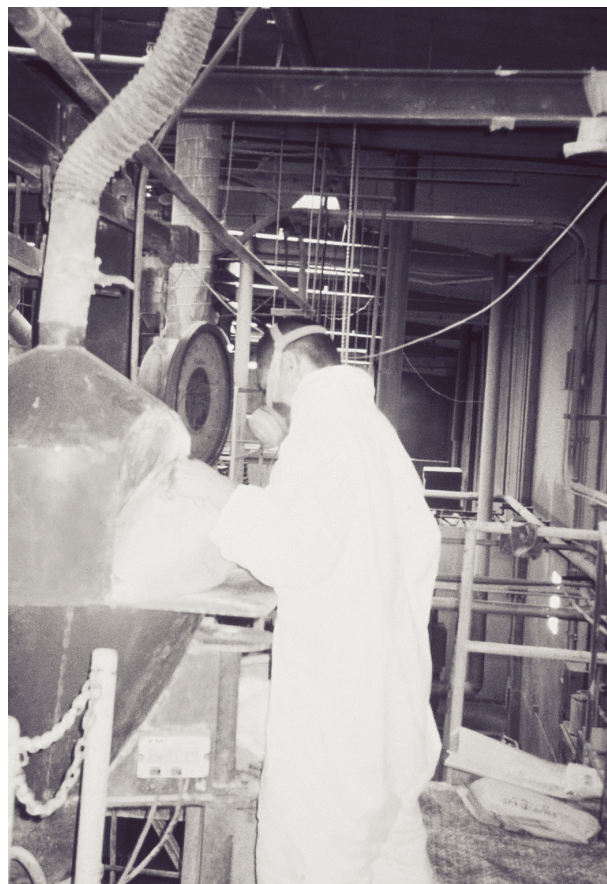
GENERAL INDUSTRY: PLASTICS COMPOUNDER

What happened?

A worker at a plastics compounding company saw his personal doctor many times over two years for symptoms of abdominal pain, fatigue, decreased appetite, and constipation. He was diagnosed with gastritis and treated unsuccessfully. After noticing the word “lead” printed on the bags of powder he worked with, the worker asked his doctor for a BLL test. His BLL was 164 µg/dl. Testing of his eight co-workers identified two more workers with severe lead poisoning (114 µg/dl, 108 µg/dl). All three workers were removed from exposure and treated by an occupational medicine physician.

The worker’s job was to scoop 6-8 pounds of pure lead sulfate powder from a bag into a large mixing vat while wearing only a paper dust mask. Lead sulfate is used as a stabilizer in plastics used for electrical devices. The product Material Safety Data Sheet (MSDS) did not mention the serious health effects of lead, and only recommended that a respirator be used for “fine dust.” The employer had interpreted this to mean a dust mask. No lead safety program was in place and the workers had never been BLL tested.

The employer worked cooperatively with OLPPP to set up a lead safety program. He switched to a pre-packaged stabilizer in a dissolvable package that was added intact to the plastics mixture to reduce exposure. Ultimately, he adopted a lead-free stabilizer.



Plastics compounding: Adding lead stabilizer to batch

What was learned?

- There is a potential for serious overexposure to lead in the compounding of plastics for use in electrical products.
- It is critical that medical providers ask patients about occupation and order a blood lead test if lead exposure is suspected.
- MSDS quality varies and practitioners, employers, and workers should seek additional health and safety information from other sources, including OSHA and state health departments.

GENERAL INDUSTRY: SCRAP METAL COMPANY

What happened?

A scrap metal recycling worker was identified with a BLL of 60 µg/dl. He had been sent to a demolition site to torch cut lead-painted steel while wearing a disposable mask. He had multiple symptoms of lead poisoning and was medically removed from working with lead.

Another worker at the same company received and sorted scrap in the company yard, as well as melted metal with a torch and poured it into an ingot. He wore no respirator. He went to his personal doctor suffering from headache, dizziness, digestive problems, nervousness, irritability, and weakness. His BLL was 29 µg/dl. He was diagnosed with lead poisoning and removed from lead work.

After the lead poisonings were discovered, the company did air monitoring, which showed levels above the Cal/OSHA Permissible Exposure Limit (PEL). The company's lead safety program was also deficient in many areas. The workers' doctor referred the company to Cal/OSHA after it failed to comply with OLPPP's recommendations. Cal/OSHA gave the company a hefty fine.

What was learned?

- Sources of lead in a scrap metal operation need to be identified and airborne lead levels measured. These are the first steps toward protecting employee health.
- A worker who has lead poisoning symptoms can be placed on medical removal protection (MRP) by a physician even if his BLL is below 50 µg/dl.
- Scrap metal workers may have exposure to lead and other toxic metals both on site and while doing demolition off site. They need to be fully protected in all settings.



Scrap metal: Cutting an industrial radiator that has lead solder

CONSTRUCTION: DEMOLITION OF FIRING RANGE

What happened?

A day laborer requested a BLL test his third day on a firing range demolition job when he went to the emergency room for a work-related injury. The workers had not been told lead was present on the job, had no protections for work with lead, and wore their work clothes home. The worker's BLL of 74 µg/dl prompted further investigation. Four other workers were tested and had BLLs ranging from 57 to 98 µg/dl; none of the workers had been on the job longer than 2-1/2 weeks. None reported prior work with lead.

The county Childhood Lead Program's public health nurse contacted the workers' families. Blood lead testing identified nine children of three workers, ranging in age from 18 months to 12 years, with BLLs of 13 to 34 µg/dl. The 18-month old child had the highest BLL. The wife of one of the workers, who hand-washed her husband's work clothes, reported symptoms similar to his. Her BLL was 36 µg/dl.

OLPPP, in collaboration with the local health department, worked with the employer, physician, and workers to address worker and family lead exposure issues and ensure safe environmental cleanup of the highly contaminated demolition site and the workers' homes.

What was learned?

- Blood lead levels can rise rapidly. The worker's BLL was 74 µg/dl after only 3 days on the job.
- Children and family members can be poisoned by lead dust taken home on a worker's clothing, shoes, and body.
- County Childhood Lead Programs play an important role in identifying family members poisoned by take-home lead and ensuring that contaminated homes are cleaned up.

GENERAL INDUSTRY: HOME-BASED CERAMICS

What happened?

A child was tested for lead as part of her pre-kindergarten exam. Her BLL was 21 µg/dl, above the Centers for Disease Control and Prevention's (CDC) level of concern of 10 µg/dl for children. The girl's mother and grandmother operated a full-time business out of their home painting ceramic tiles with lead-based paints. They were tested and had BLLs of 44 and 45 µg/dl.

The grandmother was reluctant to change to lead-free paint for fear that her primary customer would find the product unacceptable. She was also reluctant to accept that the lead paint was the main source of poisoning. The county environmental health specialist tested her home for other lead sources in house paint, water, and soil. The only source was the lead-based ceramic tile paint. After many months of follow-up by OLPPP and many visits and phone calls by the county Childhood Lead Program, the grandmother substituted lead-free tile paint and decontaminated her home.

What was learned?

- Testing a child's BLL may lead to discovery of a take-home case of lead poisoning. It is important for pediatricians to ask parents what kind of work they do.
- A home-based business can lead to 24-hour exposure of the worker and family members, as well as contamination of the home.
- When lead is used in a home-based business, the exposed owner/operator may be very reluctant to make changes for fear of losing their only income.

CONSTRUCTION: BRIDGE PAINTING COMPANY

What happened?

OLPPP heard from an occupational medicine physician who was treating a seriously lead poisoned employee of an industrial painting company. Company-provided BLL testing showed that this worker's BLL increased from 7 to 134 $\mu\text{g}/\text{dl}$ in approximately two months. The employee was immediately removed from work with lead. His BLL increased on follow-up tests over the next few days to 221 $\mu\text{g}/\text{dl}$. The worker was treated with a chelation drug to remove the dangerous levels of lead and followed closely by the physician.

For six weeks prior to the high BLL, the worker had been abrasive blasting off sections of paint with a vacuum-attached tool on a major bridge undergoing seismic retrofit. He stated that the company told him to wear a half-mask respirator for this work (the company disputed this). In the absence of air monitoring data showing lower air lead levels, the appropriate respirator would be supplied-air. The company's one relevant air monitoring result (2,300 $\mu\text{g}/\text{m}^3$) supported the need for supplied-air respirators.

Cal/OSHA inspected this job due to an enforcement emphasis program on lead in construction work. Cal/OSHA cited the company for several deficiencies including failure to ensure use of appropriate respiratory protection.



Industrial painting: Abrasive blasting in containment

What was learned?

- Abrasive blasting lead paint on steel structures often causes extremely high air lead levels, and usually calls for supplied-air respirators unless lower air levels are well documented.
- Frequent (at least monthly) blood lead testing is needed on abrasive blasting jobs to detect failures in protection before workers are seriously lead poisoned. If BLLs are rising, controls need to be re-evaluated.
- Close supervision is needed in high-exposure construction work to ensure that all aspects of the company's lead safety plan, including correct respirator selection, are executed consistently.

CONSTRUCTION: RESIDENTIAL PAINTING COMPANY

What happened?

A self-employed house painter worked for about ten days on the exterior of an 1898 Victorian house, preparing the surface by water blasting, hand scraping, and power sanding to remove old paint. For protection he wore only a paper dust mask. He smoked on the job and did not always wash up before smoking or taking breaks. He also wore home the clothes and shoes he worked in.

The painter went to his doctor because he was having chest pain and occasional dizziness, and he also asked for a blood lead test. His BLL result was 76 µg/dl.

OLPPP provided the painter with information on how to do lead-safe painting work. Then, because the worker had finished the lead-disturbing work on this job, OLPPP focused on testing others at risk and cleaning up the lead contamination created by the work. The painter's family members and the homeowner's children were tested; fortunately none had elevated BLLs. The painter and homeowner did a thorough cleanup of the home, inside and out, to ensure that lead dust and paint chips were removed.

What was learned?

- House painters doing dry hand scraping and power sanding of old lead paint without proper protections can become seriously lead poisoned in a short amount of time.
- Steps must be taken on painting jobs to keep lead dust contained in the immediate work area and clean it up using safe methods, in order to prevent contamination of the property.
- Painters need specific lead safety training so they know how to do the work in a way that does not endanger themselves, their family members, and building occupants.



Residential painting: Scraping lead paint